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腐败的决定因素——基于面板数据的实证研究

An Empirical Approach to the Determinants of Corruption Using Panel Data Analysis

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摘要

由于腐败不仅会阻碍一个国家经济的发展而且还会促进各种非法行业的滋生，人们对贪污的担忧与日俱增。在这篇文章中，我们运用固定效应模型分析从 2000 年到 2010 年 60 个国家 11 年的面板数据来寻找影响腐败的最主要因素。我们发现收入水平，政府支出和政治稳定性对腐败水平有显著的负向影响，而公民自由度，教育水平以及矿产收入的影响均不显著。

为了解决收入水平的内生性问题，我们选择 2000 年最大进口国的实际人均国民生产总值作为工具变量。我们发现，在引入工具变量之后，收入水平对腐败的影响变得更加显著。这也表明内生性问题使得未使用故居变量的估计严重有偏。

关键词：腐败；方差扩大因子；固定效应；内生性

ABSTRACT

People nowadays are concerning about corruption, not only because it hinders development and economic growth, but also it is considered the main reason for the growing of illegal business and mafias. In this paper, we construct the more recent new data set which includes 60 countries over a span of 11 years; between 2000 and 2010. For the analysis purposes, the fixed effects regression will be the main tool for regression analysis of panel data to identify the main determinants of corruption. The Results show that income, government expenditure and political stability are significant with negative effect on corruption, while civil liberty, schooling and mineral rents are insignificant.

To solve the endogeneity problem of income, we tried our best to find the right instrument that can fit our data; one instrument is found helpful in this paper which is the RGDP per capita of great importer in 2000. The results show that the effect of income on corruption is found to be much important and ignoring the correction of endogeneity makes our estimates to be severely biased.

Key words: Corruption; Variance Inflation Factor; Fixed effect; Endogeneity

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

Chapter 1 Introduction

1.1 Back ground

Corruption nowadays is the biggest global problem that hinders the reform and development of the local and international institutions. Also it is considered the main reason for the growing of illegal business and drug mafias. It may not be the most serious consequences of corruption is a waste of public money and private sectors, but it is a bug that affects the work ethic and values of the community that in return will weaken the government institutions and will hinder their performance. The health institutions and formal education for example are no longer able to perform their tasks, and if they continue to work in this path, they will collapse and stop performing efficiently in a few years.

Corruption around the world is considered as a chronic phenomenon as there is no perfect solution for it. The World Bank has identified corruption as 'the single greatest obstacle to economic and social development' (World Bank, 2001), thus ,it is possible to say that all countries suffer badly from the effects of corruption, a significant contributor to hinder economic growth and to inhibit the provision of public services. Therefore, it is important to identify the causes of corruption. In 2005, James Wolfenson, wrote in (The Economist, p. 66):

"Let's not mince words ...We need to deal with the causes of corruption"

In 1999, Amundsen wrote:

"Like a cancer, it strikes almost all parts of
the society and destroys the functioning of vital organs, means cultural, political and economic structure of society"

Finally, In 1997, Glynn, et al wrote in his paper:

".....no Region, and hardly any country,
has been immune from corruption".

The current literatures on corruption, mainly focus on identifying the possible determinants of corruption, however, not all literatures follow the same system of study; they differ either in methodology or in the type of determinants. Some literatures use cross sectional data, as in Fisman-Gatti (2002), who focus on the role of decentralization and its impact on corruption, while Ades and Tella (1999), use panel data to study the relationship between corruption and other determinants using share of imports as their main variable. In this paper, we will use six variables where real GDP per capita will be the main focus of this study. Even there are many studies have examined corruption in details within particular countries or regions by applying different models attempting to identify the determinants of corruption, but very few are known about the reason behind why corruption is higher in one place than another. Anyway, the empirical studies on corruption, nowadays, are complicated, due to some difficulties of having a complete database and also the complexity in using some of the estimations techniques.

This paper uses the Corruption Perception Index to measure corruption; this index is prepared by the Transparency International and will be used to assess the main theories of the determinants of corruption. This paper finds some important determinants through which we can control the level of corruption. Six independent variables are used for this purpose and the fixed effect model is going to be the main focus of this paper.

There have been many in-depth empirical studies related to corruption; some especially studies on the determinants of corruption. While most of the studies use cross-sectional data, very few focus on panel data analysis. However, there has been no academic study or research focusing on the determinants of corruption across 60 countries over the period 2000-2010. Furthermore, this paper suggests an instrument to solve the endogeneity problem. Therefore, this paper is not only expected to contribute significantly to this field through its empirical work but also through providing an understanding to the governments in practicing more efforts to fight corruption and to determine the main factors that can affect corruption.

1.2 Structure of the thesis

The structure and design of this thesis will be as follows. Chapter 2 includes the definitions of corruption and its method of measurements. Chapter 3 focuses on data analysis and empirical results. Finally chapter 4 includes the conclusion of this paper.

1.3 Literature Review

There are many empirical literatures have explained the determinants of corruption. However, there is no common agree on the relationship between corruption and its determinants, as mentioned by Alt and Lassen (2003). In empirical studies, it is possible to have a significant effect of one variable in one regression but becomes insignificant in other regression. Some variables have a positive effect on corruption like raw material export and income distribution, others have negative effect, like civil liberty and political stability.

The hypothesis that schooling reduces corruption is not really constant; when the population becomes more educated, corruption decreases. Brunetti and Weder (2003) used schooling as a proxy of human capital; they showed that countries with more human capital had low levels of corruption. Some empirical studies found that schooling is insignificant and has play no role on corruption as in Ades-Di Tella (1999). While Frechette (2006), showed that schooling may increase corruption rather than decreasing it; as the population had better education, people were becoming better at performing corrupt acts.

Government expenditure which was used as a proxy of the size of government had in majority a negative effect on corruption as in Fisman-Gatti (2002) who examined a cross-country relationship between government expenditure and corruption as measured by a number of different indices. While Ali-Isse(2003), showed that government expenditure may increase corruption. Peter Graeff, Guido Mehlkop & Robert Neumann (2003) studied the main determinants of corruption; the results showed that the size of government – measured by government consumption and transfers/subsidies – was a problematic factor for the explanation of corruption and it was inversely related to corruption.

Some of the previous Literatures studied the effect of real GDP per capita on corruption; some papers treated RGDP as an exogenous variable as in Ades-Di Tella (1999) and Daniel Treisman (2000). The former found that the results of the coefficient on real per capita GDP was not constant; it was negative and significant when using OLS technique, but it became positive either with significant or insignificant effect when the fixed effect model was imposed. The latter used the log of GDP per capita as a proxy of income and he found that under the OLS regression the relationship is highly significant with negative effect. Other papers considered RGDP per capita as an endogenous variable, and found that income is positively related to corruption at high significance level as in Frechette (2006).

In 2003, Jose Tavares found that political stability had a negative but insignificant effect on corruption under OLS estimation techniques using cross sectional data. The negative effect was shown by different papers as in Park (2003) and Leite-Weidmann (1999).

Using the "Global Sensitivity Analysis", Danila Serra (2004) showed that five variables were robustly related to corruption. The results showed that income, democracy, Protestant population, political stability and a country's colonial heritage all had a significant negative effect on corruption.

Using two stages least square to solve endogeneity and an "extreme bounds analysis" to test for robustness; Treisman (2000) analyzed the determinants of corruption and he found three factors were significant; more developed economic countries and those which were former British colonies were rated "less corrupt", while those which had a federal structure, were rated "more corrupt".

There are very few empirical studies that show the effect of natural resources on corruption. For example, Di-Tella (1999), used fuel and mineral exports and he found that the effect was negative but insignificant when using the World Competitiveness Report index as a corruption index, while it became positive and significant when he used Business International index (BI). Also the paper examined the hypothesis that the level of rents can determine the level of corruption in the economy. The empirical results showed that countries that enjoyed higher rents were more likely to have

higher corruption levels.

Further studies were also performed on other determinants, for example, Peter Egger and Hannes Winner (2001) found a clear positive relationship between corruption and FDI when they used a sample of 73 developed and less developed countries over the time period 1995–1999 using the fixed effect model. Frechette (2001) tried to investigate the determinants of corruption in 41 developing countries. The empirical findings concluded that, the economic determinants are much significant than the non-economic determinants in reducing corruption in those countries. Martin Paldam (2001) analyzed the impact of culture on corruption by using a religion as a proxy of culture. Using cross sectional data of 99 countries for the year 99, the results showed that several of the religions have significant effects on the level of corruption. Ali-Isse (2003), used education, role of justice, size of government, economic freedom and foreign aid determinants to identify the main differences in corruption across countries. The results showed that level of education, role of justice, and economic freedom had negative and significant effect on corruption, while foreign aid and size of government had positive and significant effect on corruption. Muhammad Tariq Majeed studied the relation between trade and corruption; the analysis suggested that in a linear specification openness to trade, corruption is increasing, while its effect is negative in a nonlinear specification. And finally, Brunetti and Weder (2004) as many other studies in this issue area, found that a strong role of law helped to reduce corruption.

Chapter 2 Corruption

2.1 Keynote speech

There are no clear assumptions to give corruption always the same meaning; it differs from time to time and from country to another, based on economic, demographic, political, and many other factors. That's why; looking for a clear definition of corruption is a difficult task. As described by Williams:

> *"It may be that, like beauty, we feel unable to define corruption, but are nevertheless confident of our ability to recognize it when we see it. Unfortunately, the visibility of corruption is largely dependent on the nature of its environment and this, of course, differs from place to place and from time to time.*[1]"

There are many definitions made by officials in the private sectors for research purposes, but the commonly accepted definition of corruption, is the use of public office for private gain[2]. Here are some close definitions of corruption:

1. The Longman's Dictionary of Contemporary English (1995) defines corruption as "dishonest, illegal or immoral behavior especially from someone with power."
2. According to the Transparency International, 2003, corruption is defined as "the abuse of entrusted power for private gain."
3. The Danish International Development Agency (DANIDA) defines corruption as "the misuse of entrusted power for private gain."[3]
4. The World Bank defines corruption as "the abuse of public office for private gain."

[1] Robert J. Williams, '(The Problem of Corruption: A conceptual and Comparative Analysis', in Robert Williams, ed., Explaining Corruption. Cheltenham: Edward Elgar Publishing Ltd, 2000, pp. 22-4.)

[2] Pranab Bardhan,'Coruption and Development: A Review of Issues', Journal of Economic Literature, 35 (1997), pp.1320-46; Tanzi, op.cit.

[3] DANIDA-transparency website: http://um.dk/en/danida-en/

2.2 Corruption measurements[4]

2.2.1 Corruption Perception Index (CPI)[5]

Since1995, Transparency International (TI) has annually published the Corruption Perceptions Index (CPI) to rank countries according to their corruption levels as determined by experts and public surveys. The (TI) generally defines corruption as the misuse of public power for private benefit[6].

(TI) ranked countries from 1995 to 2011 between 0 (highly corrupt) and 10 (low corrupt), but this scale has been actually changed since 2012. The (TI) issued a new CPI scale. The (TI) currently ranks 176 countries between 100 (very clean) and 0 (highly corrupt)[7].

2.2.2 Percentile Rank

It is one of the WGI[8] which produced by Daniel Kaufmann (Revenue Watch and Brooking Institution), Aart kraay (World Bank Development Research Group) and Massimo Mastruzzi (World Bank Institute).[9] This corruption index measures the corruption level at which public power is misused for private gain, and it represents the percentage of all countries that have higher corruption level than the selected country. It ranks countries between 0 and 100; 0 indicates for highest level of corruption and 100 for corruption free country.

Table (1) presents the correlation matrix between TI index and WGI index. It shows a high correlation, 0.94. This high correlation indicates that these corruption indices are consistent even though they are based on different methodologies. Table (2) shows the ranks of the top ten corrupt countries and the top ten clean countries. Figures (1) also graphs the corruption level for these countries. It is very obvious how large is the gap in the corruption level between top clean countries and top corrupt countries; whereas the corruption level for the top clean countries is above 90

[4] There are many indices that have been used to measure corruption, but this paper will mention only two indices.

[5] The CPI is the main focus of this study, the data are collected from the TI website over the period 2000-2010.

[6] Transparency International (2010).

[7] Transparency International (2012).

[8] The Worldwide Governance Indicators . The WGI are not an official product of the World Bank, even, they are not used by the WB for research purposes.

[9] WGI website: www.govindicators.org

percentile rank, it is almost 0 to less than 10 for the top corrupt countries. This gap may give evidence that the determinants of corruption in one country, is not necessarily the same for other country.

Table 1: Correlation matrix between TI index and WGI index

CPI_2010	Prank2010	Prank1996	
1.0000	0.9423	0.7576	CPI_2010
	1.0000	0.7767	Prank2010
		1.0000	Prank1996

Source of data: Transparency International, WGI

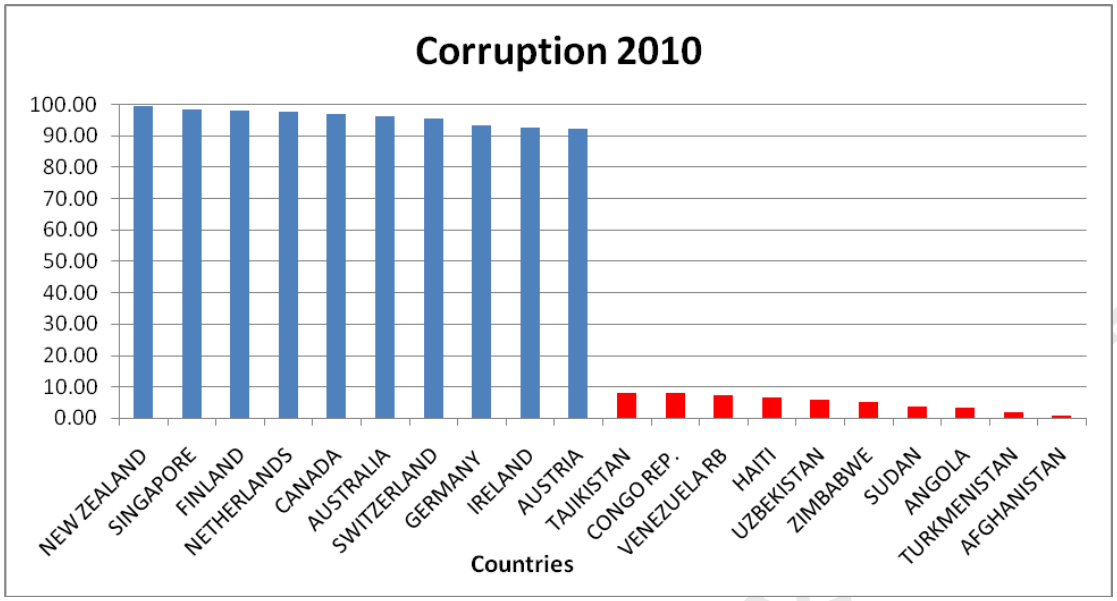
Table 2: Top and Bottom Ten Countries, 2010

No	Top Clean Countries		Top Corrupt Countries	
	Country	**P-rank**	**Country**	**P-rank**
1	NEW ZEALAND	99.52	AFGHANISTAN	1.00
2	SINGAPORE	98.56	TURKMENISTAN	1.91
3	FINLAND	98.09	ANGOLA	3.35
4	NETHERLANDS	97.61	SUDAN	3.83
5	CANADA	97.00	ZIMBABWE	5.26
6	AUSTRALIA	96.17	UZBEKISTAN	5.74
7	SWITZERLAND	95.69	HAITI	6.70
8	GERMANY	93.30	VENEZUELA RB	7.18
9	IRELAND	92.82	CONGO REP.	8.00
10	AUSTRIA	92.34	TAJIKISTAN	8.13

Source of data: WGI

Percentile rank index ranges from 0-100 where 0 indicates most corruption and 100 indicates corruption free.

Figure 1: The most 10 corrupted and clean countries in 2010



Source of data: WGI 2010

Percentile rank index ranges from 0-100 where 0 indicates most corruption and 100 indicates corruption free.